

다음 항의 값을 역함수의 미분법을 이용해 구하라

$y = \sin^{-1} x, -1 < x < 1$

→ 역함수 미분

<역함수 미분>  $y = f^{-1}(x) \Rightarrow \frac{dy}{dx} = \frac{1}{f'(f^{-1}(x))}$

$x = \sin y$

$1 = y' \cos y$   
 $y' = \frac{1}{\cos y} = \frac{1}{\pm \sqrt{1-x^2}}$

$-1 < \sin y < 1$   
 $(y \neq \frac{\pi}{2} k, k \text{는 } 0010141 \text{인 정수})$

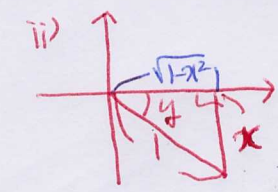
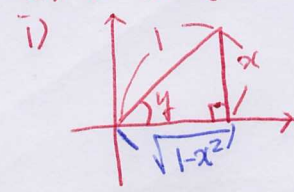
$\sin^2 y + \cos^2 y = 1$   
 $\cos^2 y = 1 - \sin^2 y$   
 $\cos y = \pm \sqrt{1 - \sin^2 y}$   
 $= \pm \sqrt{1 - x^2}$

$-\frac{\pi}{2} < y < \frac{\pi}{2}$

$f^{-1}(x) = \sin^{-1} x$   
 $\Rightarrow f(x) = \sin x$   
 $f'(x) = \cos x$

$y = \sin^{-1} x$   
 $\Leftrightarrow x = \sin y$

$\Rightarrow \frac{dy}{dx} = \frac{1}{\cos(\sin^{-1} x)}$   
 $= \frac{1}{\cos y} = \frac{1}{\sqrt{1-x^2}}$



(1)